

**To:** Werner, Lora[Werner.Lora@epa.gov]; Ferrell, Mark[Ferrell.Mark@epa.gov]; Burns, Francis[Burns.Fran@epa.gov]; Matlock, Dennis[Matlock.Dennis@epa.gov]  
**Cc:** Arguto, William[Arguto.William@epa.gov]; Wisniewski, Patti-Kay[Wisniewski.Patti-Kay@epa.gov]  
**From:** binetti, victoria  
**Sent:** Thur 2/27/2014 2:25:33 PM  
**Subject:** FW: West Virginia spill questions  
EPA600-R-12-032, REMOVING BC CONTAMINATION FROM BUILDING'S PLUMBING.PDF

This is the info that was provided to the Wall Street Journal, based on input from our Water Security Division and ORD Homeland Security Research Center.--Vicky

**From:** Perry, Dale  
**Sent:** Wednesday, February 26, 2014 9:54 AM  
**To:** binetti, victoria  
**Subject:** FW: West Virginia spill questions

This is what Caroline sent back to WSJ.

Dale H. Perry, Ph.D.

Science Advisor to the Office of External Affairs & Environmental Education

1200 Pennsylvania Ave. N.W., Mail Code 1701A

Washington, D.C., 20460

Office: 202-564-7338

Cell: 202-380-6517

**From:** Behringer, Caroline  
**Sent:** Tuesday, February 25, 2014 10:10 AM  
**To:** Perry, Dale  
**Subject:** FW: West Virginia spill questions

Take 2:

**Question 3: Does the EPA have any specific guidelines or research on how to do flushing in a decontamination event?**

**Response:** EPA has developed a substantial body of guidance and tools that address detection of contamination incidents, design of contamination warning systems, contamination incident response plans, and laboratory capabilities. More information on these products can be found at <http://water.epa.gov/infrastructure/watersecurity/lawsregs/initiative.cfm>

Flushing a drinking water distribution system following a contamination incident is implemented at two scales: 1) the utility's distribution system, which includes the network of large pipes, tanks and pumps that deliver water to individual buildings; 2) the premise plumbing system that distributes water within a building. EPA has developed guidance and tools for flushing both of these systems.

Utility distribution systems: These systems are large, complex, and unique to an individual utility. For this reason, the best approach to developing a flushing plan is use of a computer model of the distribution system. EPA has developed EPANET, a software application that allows a drinking water utility to simulate the flow of water and contaminants through a distribution system (<http://www.epa.gov/nrmrl/wswrd/dw/epanet.html>). The drinking water utility in Charleston used this approach to develop their flushing plan.

Premise plumbing systems: These systems include the piping and appliances that distribute and use water in an individual building. They are owned and maintained by the building owner, and the construction of a premise plumbing system is typically governed by state or local building codes.

Chapter 6 of the attached report provides a thorough discussion of the factors to consider when determining how to decontaminate a premise plumbing system. Flushing the contaminated water from the plumbing system will typically be the first step. (EPA600-R-12-032, REMOVING BC CONTAMINATION FROM BUILDING'S PLUMBING.PDF)

More broadly the objectives of the study described in this report were to measure and model the

adherence and subsequent removal of chemical and biological contaminants in premise plumbing systems. The contaminants evaluated in this study were selected because EPA scientist suspected that they would adhere to pipe surfaces, thus presenting a unique decontamination challenge (a list of the contaminants and pipe materials studied is presented in Table ES 1). The findings from this research lead to the development of the general guidelines for flushing premise plumbing, which are presented in Section 6. While these guidelines are applicable to a broad range of contaminants, the specific findings about the adherence of contaminants to pipe surfaces are applicable only to those contaminants studied, and in the context of this story it is important to note that MCHM was not one of the contaminants evaluated. Furthermore, this study did not attempt to assess the water quality or public health implications of contaminant adherence to pipe surfaces.

Caroline Behringer

Deputy Press Secretary

Office of the Administrator

U.S. Environmental Protection Agency

Office: (202) 564-0098

Cell: (202) 760-1732

**From:** Berzon, Alexandra [<mailto:Alexandra.Berzon@wsj.com>]

**Sent:** Monday, February 24, 2014 4:22 PM

**To:** Behringer, Caroline

**Subject:** RE: West Virginia spill questions

Thanks very much Caroline – I just want to double check – does the EPA have any specific guidelines or research on how to do flushing in a decontamination event? If it is covered in one of the studies below please just point that out. Thanks.

**From:** Behringer, Caroline [<mailto:Behringer.Caroline@epa.gov>]

**Sent:** Monday, February 24, 2014 12:58 PM

**To:** Berzon, Alexandra

**Subject:** RE: West Virginia spill questions

Alexandra,

Here's some additional information on an earlier question you had asked, as well as the question you asked regarding Mr. Whelton, since the two are related.

Thanks,

Caroline

**Question:** I also would like to know more broadly what do we know about what happens when a chemical gets into water pipes and what testing/work is being done on this or has been done? I believe this would be part of the EPA's water security work.

**Response:** US EPA has conducted extensive research and developed numerous programs and products that directly address the technical and logistical issues and challenges associated with drinking water distribution system contamination. However, we have not done any work on the specific chemical involved in the WV spill – MCHM.

A non-technical overview of some of EPA's research in this area can be found in a recent edition of EPA's "Science Matters" newsletter available at <http://www.epa.gov/sciencematters/homeland/index.htm>

A few examples of these products are listed below:

1. Decontamination of chemical agents from drinking water infrastructure: A literature review and summary: This is a literature review by US EPA with contributions by Environment Canada. It is a summary of chemical agent persistence on drinking water infrastructure (distribution system and home plumbing). It contains organic chemical data on chlordane, p-dichlorobenzene, parathion, chlorpyrifos, and sodium fluoroacetate. This article is in-press in the high-impact factor, international, peer reviewed journal *Environment International*. A

corrected proof provided by the journal is in the file “chem scoping report.pdf”

2. Chemical Contaminant Persistence and Decontamination in Drinking Water Pipes: This US EPA report presents a standardized persistence and decontamination experimental design protocol that can be used across laboratories to perform drinking water pipe decontamination research. Using the protocol, the report evaluation decontamination alternatives, such as flushing and hyperchlorination, for removal of organic contaminants (sodium fluoroacetate and chlordane) from simulated piping materials, such as cement mortar lined iron and PVC plastic. EPA/600/R-12/514, 2012 available at [http://cfpub.epa.gov/si/si\\_public\\_file\\_download.cfm?p\\_download\\_id=506663](http://cfpub.epa.gov/si/si_public_file_download.cfm?p_download_id=506663)

3. Pilot-scale tests and systems evaluation for the containment, treatment, and decontamination of selected materials from T&E building pipe loop equipment: This US EPA report contains the results of decontamination studies that utilized cement-mortar pipe material, which is commonly used in drinking water distribution systems. Chemicals evaluated in this study include arsenic, mercury and chlordane. EPA/600/R08/016, 2008 available at [http://cfpub.epa.gov/si/si\\_public\\_file\\_download.cfm?p\\_download\\_id=498218](http://cfpub.epa.gov/si/si_public_file_download.cfm?p_download_id=498218)

**Question:** Andrew Whelton from the University of Southern Alabama who is working heavily in WV right has said publicly (including today at a press conference in Charleston) that the studies from the EPA did not look specifically at how chemicals stay or can be removed specifically from piping in people’s homes. He’s saying that this has never been really studied in a civilian context and is critical on the EPA’s water security work on this. Can you respond to that and tell me if he’s right that this has not been studied or point to any studies that do look at that?

**Response:** In the media coverage we’ve seen, Mr. Whelton says that “authorities have little to no information about exactly what this chemical does to drinking water plumbing systems.” To our knowledge, there are no studies that investigate the fate and transport of MCHM in either distribution system or household plumbing systems. A new study would need to be designed and implemented to characterize the interaction between MCHM and common plumbing materials.

However, EPA has studied chemical interactions in household plumbing systems. In the studies listed above and below, we focused on high priority contaminants. MCHM was not on a priority list. There are 100’s of types of pipe materials, and 10’s of thousands of contaminants (not just chemical, but also biological and radiological). We must approach research strategically,

focusing on the highest priority contaminants, and studying a diverse set of contaminants and materials so that we can use those results to hypothesize about the behavior of other contaminants or materials that were not directly tested.

A few examples are:

1. US EPA collaborated with the National Institute of Standards and Technology (NIST) on a study that evaluated contaminant accumulation and subsequent decontamination of premise plumbing systems (i.e., “plumbing in people’s homes”). The results from this study were published in September 2009 and can be found at:

[http://cfpub.epa.gov/si/si\\_public\\_file\\_download.cfm?p\\_download\\_id=506685](http://cfpub.epa.gov/si/si_public_file_download.cfm?p_download_id=506685) which is the final report from the study. NIST also published as “NIST Technical Note 2009-1652” in 2009, which published some initial recommendations for building plumbing system decontamination [http://www.nist.gov/manuscript-publication-search.cfm?pub\\_id=861645](http://www.nist.gov/manuscript-publication-search.cfm?pub_id=861645)

2. The studies in the responses to the first question highlighted above have involved studies with a number of pipe materials, including those used in residential and building plumbing. Thus, these results are applicable to people’s homes.

Caroline Behringer

Deputy Press Secretary

Office of the Administrator

U.S. Environmental Protection Agency

Office: (202) 564-0098

Cell: (202) 760-1732

**From:** Berzon, Alexandra [<mailto:Alexandra.Berzon@wsj.com>]

**Sent:** Monday, February 24, 2014 3:00 PM

**To:** Behringer, Caroline

**Subject:** RE: West Virginia spill questions

I also have not received a response to this question. Thank you.

**From:** Berzon, Alexandra  
**Sent:** Friday, February 21, 2014 1:31 PM  
**To:** 'Behringer, Caroline'  
**Subject:** RE: West Virginia spill questions

Thanks Caroline – Andrew Whelton from the University of Southern Alabama who is working heavily in WV right has said publicly (including today at a press conference in Charleston) that the studies from the EPA did not look specifically at how chemicals stay or can be removed specifically from piping in people's homes. He's saying that this has never been really studied in a civilian context and is critical on the EPA's water security work on this. Can you respond to that and tell me if he's right that this has not been studied or point to any studies that do look at that?

**From:** Behringer, Caroline [<mailto:Behringer.Caroline@epa.gov>]  
**Sent:** Friday, February 21, 2014 1:28 PM  
**To:** Berzon, Alexandra  
**Subject:** RE: West Virginia spill questions

Hey Alexandra,

Here's an answer to one of your original questions. Still working on the others.

**I also would like to know more broadly what do we know about what happens when a chemical gets into water pipes and what testing/work is being done on this or has been done? I believe this would be part of the EPA's water security work.**

EPA has publically available documents about the various issues in cleaning a water distribution system. These will not speak to the **specific** characteristics of any chemical or why some

chemicals are harder to clean than others.

<http://water.epa.gov/infrastructure/watersecurity/emerplan/index.cfm#pp8>

Thanks,

Caroline

Caroline Behringer

Deputy Press Secretary

Office of the Administrator

U.S. Environmental Protection Agency

Office: (202) 564-0098

Cell: (202) 760-1732

**From:** Berzon, Alexandra [<mailto:Alexandra.Berzon@wsj.com>]

**Sent:** Friday, February 21, 2014 3:45 PM

**To:** Behringer, Caroline

**Subject:** RE: West Virginia spill questions

This was the response from the water company – do you know if this is referring to the same report?

My understanding is that the information given to the EPA was not a report on flushing. It is information taken from a study conducted by the Water Research Foundation dealing with contaminants (not MCHM) in water distribution systems and it is not a public document.

**From:** Behringer, Caroline [<mailto:Behringer.Caroline@epa.gov>]

**Sent:** Thursday, February 20, 2014 3:34 PM

**To:** Berzon, Alexandra



**Subject:** RE: West Virginia spill questions

I don't know if they've been giving it out – you'd need to ask them.

Caroline Behringer

Deputy Press Secretary

Office of the Administrator

U.S. Environmental Protection Agency

Office: (202) 564-0098

Cell: (202) 760-1732

**From:** Berzon, Alexandra [<mailto:Alexandra.Berzon@wsj.com>]  
**Sent:** Thursday, February 20, 2014 6:34 PM  
**To:** Behringer, Caroline  
**Subject:** RE: West Virginia spill questions

J I will ask them but do you know if they have been giving this out? They are not a public agency so that's why I am starting with the EPA which I think should also provide it. Thanks.

**From:** Behringer, Caroline [<mailto:Behringer.Caroline@epa.gov>]  
**Sent:** Thursday, February 20, 2014 3:33 PM  
**To:** Berzon, Alexandra  
**Subject:** RE: West Virginia spill questions

Please ask WVAW for a copy of that document.

Thanks,

Caorline

Caroline Behringer

Deputy Press Secretary

Office of the Administrator

U.S. Environmental Protection Agency

Office: (202) 564-0098

Cell: (202) 760-1732

**From:** Berzon, Alexandra [<mailto:Alexandra.Berzon@wsj.com>]

**Sent:** Thursday, February 20, 2014 6:32 PM

**To:** Behringer, Caroline

**Subject:** RE: West Virginia spill questions

I will ask them but is it possible for you to please send as well? Thank you.

**From:** Behringer, Caroline [<mailto:Behringer.Caroline@epa.gov>]

**Sent:** Thursday, February 20, 2014 3:32 PM

**To:** Berzon, Alexandra

**Subject:** RE: West Virginia spill questions

Please also reach out to WVAW for a copy of the document.

Thanks,

Caroline

Caroline Behringer

Deputy Press Secretary

Office of the Administrator

U.S. Environmental Protection Agency

Office: (202) 564-0098

Cell: (202) 760-1732

**From:** Behringer, Caroline  
**Sent:** Thursday, February 20, 2014 6:31 PM  
**To:** 'Berzon, Alexandra'  
**Subject:** RE: West Virginia spill questions

Alexandra – You would obviously need to FOIA the correspondence between the two groups.  
I'll work on getting you responses for the rest.

Thanks,

Caroline

Caroline Behringer

Deputy Press Secretary

Office of the Administrator

U.S. Environmental Protection Agency

Office: (202) 564-0098

Cell: (202) 760-1732

**From:** Berzon, Alexandra [<mailto:Alexandra.Berzon@wsj.com>]  
**Sent:** Thursday, February 20, 2014 6:29 PM  
**To:** Behringer, Caroline  
**Subject:** RE: West Virginia spill questions

Thanks Caroline – can you please send me the draft document or a description from WVAW . Was this in response to an EPA inquiry on this? Why did the EPA make that inquiry? Is there concern about the method (I have heard from an outside scientist some concerns)? Can you please send me all correspondence between the EPA and WVAW on this? Thanks.

**From:** Behringer, Caroline [<mailto:Behringer.Caroline@epa.gov>]  
**Sent:** Thursday, February 20, 2014 3:26 PM  
**To:** Berzon, Alexandra  
**Subject:** West Virginia spill questions

Alexandra,

In response to your questions to our Region 3 office, I'm including some information below. I'm also attaching the two reports you requested, and we're working on a response to your question about chemicals in pipes.

**In WV we would like to know what is the EPA's involvement in terms of understanding why there still appears to be an odor from MCHM in some places in Charleston and some lingering health effects being reported.**

EPA received a draft summary document from West Virginia American Water Company (WVAWC) on February 18, 2014, which describes the approach, and the science behind the approach, WVAWC took in concluding that their flushing method would be effective in removing MCHM from the water distribution system. EPA is conducting an internal review of the document. (see additional information below about MCHM odor at the tank site)

**What work is the EPA still doing in West Virginia and what do they understand at this point about the situation?**

An EPA On-Scene Coordinator has been on the ground in Charleston at the Freedom Industries tank farm, where the spill occurred since day-two of the response. The site is stabilized and work continues to control the source of the contamination at the site. EPA has observed the emptying of the leaked tank and its two companion tanks. The remaining 14 tanks are being systematically emptied. The collection trenches, sumps and collection piping are collecting the water and remaining chemical that was under the leaked tank. EPA's OSC has reported that the snow and rain have generated considerable amounts of water through the facility, both surface and subsurface water. EPA, WV Department of Environmental Protection and Freedom Industries have sampled the water collected from several points on the site, which are being analyzed. The collection mechanisms have been effective in containing the water that continues to seep from the site. The facility has hired a contractor to develop a long term remediation plan to find and remove any residual contamination.

EPA's OSC anticipates reports of odor complaints when tanks are moved, during excavation, and also as the weather warms up. The odor is present on site, however, in colder temperatures the odor diminishes at the perimeter of the facility, according to EPA's OSC. WVDEP has requested EPA to do air monitoring around the site during the removal of three specific tanks that did not contain MCHM and PHH. EPA's air monitoring analytical method is under development.

**Do you know who came up with the flushing instructions to residents – was the EPA involved in that and what research was that based on?**

The State and West Virginia American Water Company (WVAWC) developed a flushing protocol for homeowners to flush their household plumbing.

Thanks,

Caroline

Caroline Behringer

Deputy Press Secretary

Office of the Administrator

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